Simplified plot plans showing the location of each facility structure and EU are provided in Figure 2 through Figure 7.

2.8 Meteorological Data

Hourly meteorological data used for air quality modeling must be spatially and climatologically representative of the area of interest. The Modeling Guideline recommends a minimum of one year of site-specific meteorological data or five consecutive years from the most recent, readily available data collected at the nearest National Weather Service (NWS) station. Required surface meteorological data inputs include hourly observations of wind speed, wind direction, temperature, and Pasquill-Gifford (P-G) stability class. The ISC3 model also requires concurrent mean morning and afternoon mixing heights calculated based on twice-daily upper air soundings and surface observations.

Surface meteorological data have been collected at the Thompson Creek mine for at least the last several years. Parameters include 10-meter wind speed, wind direction, ambient temperature, and precipitation. On-site data from 2001 through 2004 were obtained and data for calendar years 2003 and 2004 were reviewed. Several problems with this data were noted, including:

- There is no documentation of calibrations, equipment maintenance, instrument repairs, or site visits, so the data quality is questionable at best.
- This dataset does not include any parameters such as wind speed standard deviation, solar radiation intensity, cloud cover, or cloud ceiling height, that are required to calculate stability class values.

An examination of the Thompson Creek wind rose and raw data files shows that during 2003 and 2004 there were no hourly average wind directions between approximately 300 degrees and 30 degrees; that is, no winds from the northwest through east-northeast sectors were reported (see Figure 8). This is highly suspect, and indicates that there is a problem with either the sensor or the data processing.

Based on the above findings, the Thompson Creek dataset was considered unacceptable for use in the dispersion modeling analysis.

As a result of discussions with IDEQ, surface meteorological data collected at the Boise, Idaho NWS station, and mixing height data collected at the Pocatello, Idaho NWS station during calendar years 1987 through 1991, were deemed to be the most representative, readily available meteorological data for use in the modeling analysis. These data were provided by IDEQ in model-ready format on December 6, 2005. A wind rose compiled from the 1987-1991 Boise data is provided in Figure 9.

2.9 Rural/Urban Classification

An Auer land-use analysis, as described in 40CFR51 Appendix W was conducted to determine the appropriate dispersion coefficients to use in the ISC3 model. A topographic map of the area within 3 km of the facility (Figure 1) shows that there are no areas that can be classified as urban; therefore, the rural dispersion coefficients were used in ISC3.

2.10 Background Concentrations

Representative background concentrations were added to the model-predicted impacts at each receptor for comparison to the NAAQS. Background PM_{10}, NO_2, SO_2, and CO concentrations are provided in Table 4. These data were provided by IDEQ on December 5, 2005.

2.11 Ambient Air Boundary

The facility is located in a remote area. Access roads into the facility are controlled by locked and/or guarded gates. In addition, portions of the property are fenced and/or posted as necessary to preclude public access. Public access is further limited and made difficult to impossible by steep, extremely rugged terrain which acts as a physical barrier to access. Vehicle-accessible roads in much of the surrounding area are also limited.

Consistent with the physical limits to public access described above, the ambient air boundary was established along the boundary of TCMC's patented and unpatented mill sites. In addition, physical or topographic features that preclude public access to the facility, such as steep terrain or distance from accessible roads, were also used to establish the ambient air boundary. The ambient air boundary is shown in Figure 2.

2.12 Receptor Network

Cartesian receptor grids centered on the facility were defined using Universal Transverse Mercator (UTM) Zone 11 NAD27 coordinates. The grids were designed to accurately resolve the highest predicted pollutant impacts while at the same time minimizing model execution time. Several receptor grids of varying resolution were defined for the required model analyses, following guidance found in IDEQ (2002). The grids consisted of a set of nested receptors placed at:

- 25-meter resolution along the ambient air boundary.
- 25-meter resolution extending to a distance of 500 m from the ambient air boundary.

- 100-meter resolution extending to 2 km in each cardinal direction from the ambient air boundary.

- 250-meter resolution extending to 5 km in each cardinal direction from the ambient air boundary.

Receptor grid locations are shown in Figure 10 and Figure 11.

2.13 Elevation Data

Elevation data for all receptors was obtained by interpolating USGS 1:24,000 DEM data using Golden Software's SURFER application. Whenever possible, the base elevations of facility structures and EUs were obtained from a recent topographic map of the facility provided by TCMC rather than from DEM data.

Contoured receptor elevations are shown in Figure 12 and Figure 13. As seen in these figures, receptor elevations interpolated from the DEM data closely match the elevation contours shown on the topographic base maps.

2.14 Conversion Ratio for Determining Predicted NO_2 Concentrations

Ambient NO_2 impacts can be estimated using a two-tier approach, as recommended in the Modeling Guideline. The first and most conservative tier assumes that all emitted nitrogen oxides are in the form of NO_2. The second tier uses the Ambient Ratio Method (ARM), which accounts for atmospheric conversion of NO to NO_2 by assuming that a fraction of emitted NO_x is converted to NO_2. The Modeling Guideline recommends that predicted annual NO_x impacts be multiplied by an empirically-derived NO_2-to-NO_x ratio of 0.75. This ratio is a national annual default value that is applicable to urban areas.

All NO_2 impacts reported in this document use the first tier approach. That is, it was assumed that all NO_x emitted from each EU was in the form of NO_2.

2.14.1 Preliminary Impact Determination

A preliminary impact determination was completed to determine whether facility EUs could cause a significant off-site impact; defined as impacts exceeding the significant contribution levels (SCLs) shown in Table 5. The procedure is briefly outlined below.

Maximum predicted impacts (high-first-high) due to project EUs were compared to the SCLs. The purpose of this analysis was to demonstrate whether significant ambient concentrations due to these EUs could be expected, and if so, how far those significant concentrations extend past the facility ambient air boundary. The resulting maximum significant impact radius for each pollutant was determined separately.

Emission rates used for the preliminary impact determination were allowable emission rates.

The preliminary impact determination was used to establish the significant impact radius and significant impact area (SIA). The significant impact radius is the maximum distance from the facility ambient air boundary to where the predicted impacts meet or exceed the SCLs for each applicable pollutant and averaging period.

The results of the preliminary impact determination are shown in Table 6. As seen in this table, the SCLs were exceeded for all pollutants except CO. Since the maximum predicted impact for CO was less than the SCL, no further analyses were performed for that pollutant.

Contour plots of the maximum predicted NO_2, SO_2, and PM_{10} impacts (not shown) indicated that the maximum significant impact radius extended approximately 5 km from the ambient air boundary. In addition, the concentration gradients of all pollutants were found to be decreasing in all directions beyond approximately 5 km from the ambient air boundary. Therefore, for subsequent impact analyses the receptor grid was extended only to 5 km beyond the ambient air boundary.

2.14.2 NAAQS Analysis

A NAAQS analysis was performed for NO_2, SO_2, and PM_{10}, since the maximum predicted ambient air quality impact due to TCMC sources exceeded the SCLs for each of these pollutants. The NAAQS are the maximum concentrations allowed in terms of total pollutant levels in ambient air.

Compliance with the NAAQS is based on the total estimated air quality concentration, which was assumed to be the sum of the following:

- Maximum estimated ambient impacts resulting from all facility EUs modeled at their allowable emission rates.
- Background concentrations.

High-first-high impacts for each year modeled were used for annual averaging periods as well as short-term averaging periods. This provides a conservative estimate of the maximum short-term impacts, since Idaho air quality regulations allow for at least one short-term exceedance per year.

The results of the NAAQS analysis are provided in Table 7 and Figure 14. As seen in Table 7, the maximum model-predicted impacts, when combined with background concentrations, were below the NAAQS for all modeled pollutants.

3 References

Idaho Department of Environmental Quality Air Quality Division (IDEQ). 2006. Thompson Creek Mine Modeling Protocol Approval Letter. Email communication between Mr. Kevin Schilling (IDEQ) and Peter Miller (RETEC). March 23, 2006.

Idaho Department of Environmental Quality Air Quality Division (IDEQ). 2005. Personal communication between Peter Miller and Jamie Christopher of The RETEC Group, Inc. (RETEC) and Mr. Kevin Schilling of the IDEQ, September 21, 2005.

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The RETEC Group, Inc. (RETEC). 2006. Tier II Operating Permit Modeling Protocol for the Thompson Creek Mine. Prepared for Thompson Creek Mining Company. March 2006.

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United States Environmental Protection Agency (USEPA). 1992. Mine Site Visit: Cyprus Thompson Creek. Available at http://www.epa.gov/epaoswer/other/mining/techdocs/phos/phosmol2.pdf. June 1992.

United States Environmental Protection Agency (USEPA). 1990. New Source Review Workshop Manual: PSD and Nonattainment Area Permitting. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. June 1990.

Table 5 Ambient Air Quality Standards and Thresholds

Pollutant	Averaging Period	Significant Contribution Level ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	3-hour	25	1,300 [1]
	24-hour	5	365 [1]
	Annual	1	80 [3]
PM_{10}	24-hour	5	150 [2]
	Annual	1	50 [3]
NO_2	Annual	1 [4]	100 [3]
CO	1-hour	2,000	40,000 [1]
	8-hour	500	10,000 [1]

[1] Not to be exceeded more than once per year

[2] The standard is attained when the average number of exceedances per year is less that or equal to one.

[3] Not to be exceeded in any calendar year

[4] The significant contribution level applies to the total NO_x impact.

Table 6 Maximum Predicted Ambient Air Quality Impacts Compared to SCLs

Pollutant	Averaging Period	Maximum Impact Location [1] UTM X (m)	UTM Y (m)	Elevation (ft)	Maximum Predicted Impact [2] ($\mu g/m^3$)	Significant Contribution Level ($\mu g/m^3$)	Impact > SCL?
NO_2	Annual [3]	699465	4909888	6809	4.7	1	Yes
SO_2	3-hour	698175	4908200	7638	102.5	25	Yes
	24-hour	699465	4909888	6809	32.4	5	Yes
	Annual	697834	4908106	7680	2.5	1	Yes
PM_{10}	24-hour	694435	4908970	7650	96.7	5	Yes
	Annual	696415	4908990	7492	3.8	1	Yes
CO	1-hour	699407	4909746	6819	393.3	2,000	No
	8-hour	699465	4909888	6809	194.2	500	No

[1] UTM Zone 11, NAD27 coordinates

[2] High-first-high model-predicted impact

[3] Assumes 100 percent of NO_x emissions are in the form of NO_2

Table 7 Maximum Predicted Ambient Air Quality Impacts Compared to NAAQS

Pollutant	Averaging Period	Maximum Impact Location [1] UTM X (m)	UTM Y (m)	Elevation (ft)	Maximum Predicted Impact [2] ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
NO_2	Annual [3]	699465	4909888	6809	4.7	4.3	9.0	100	9
SO_2	3-hour	698175	4908200	7638	102.5	34	136.5	1,300	11
	24-hour	699465	4909888	6809	32.4	26	58.4	365	16
	Annual	697834	4908106	7680	2.5	8	10.5	80	13
PM_{10}	24-hour	694435	4908970	7650	96.7	43	139.7	150	93
	Annual	696415	4908990	7492	3.8	9.6	13.4	50	27

[1] UTM Zone 11, NAD27 coordinates

[2] High-first-high model-predicted impact

[3] Assumes 100 percent of NO_x emissions are in the form of NO_2

Appendix B
CDROM File Contents

RETEC

This CD-ROM contains model input/output files and associated modeling data used for the Thompson Creek Mining Company Tier II Operating Permit Application.

The individual file contents for each directory are described below:

BPIP

General Description

This folder contains BPIP input and output files.

File Name	File Contents
bpip.prn	BPIP input file
bpip.out	BPIP output file
bpip.sum	BPIP summary output file

EXECUTABLE_FILES

General Description

This folder contains all model and processor executable files used for the modeling analysis.

File Name	File Contents
bpipprim.exe	EPA-compiled BIPI PRIME executable
iscst3_lf95.exe	EPA ISC3 source code compiled using Lahey Fortran 95. Note: no changes were made to the model source code.

Appendix C Application Forms/Emissions Inventory

Tables

Appendix B Facility Process Flow Diagrams

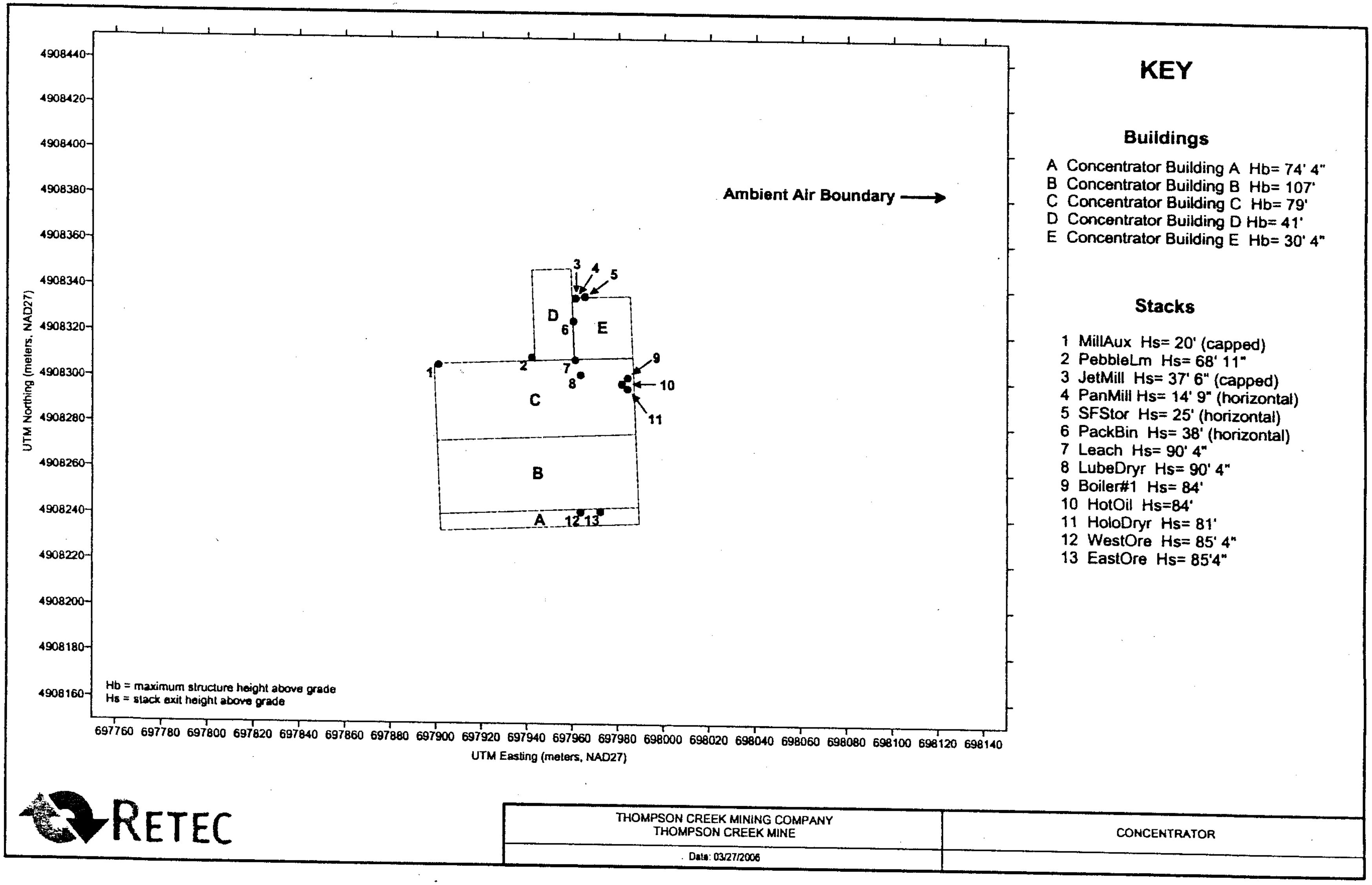


Figure 7 Concentrator

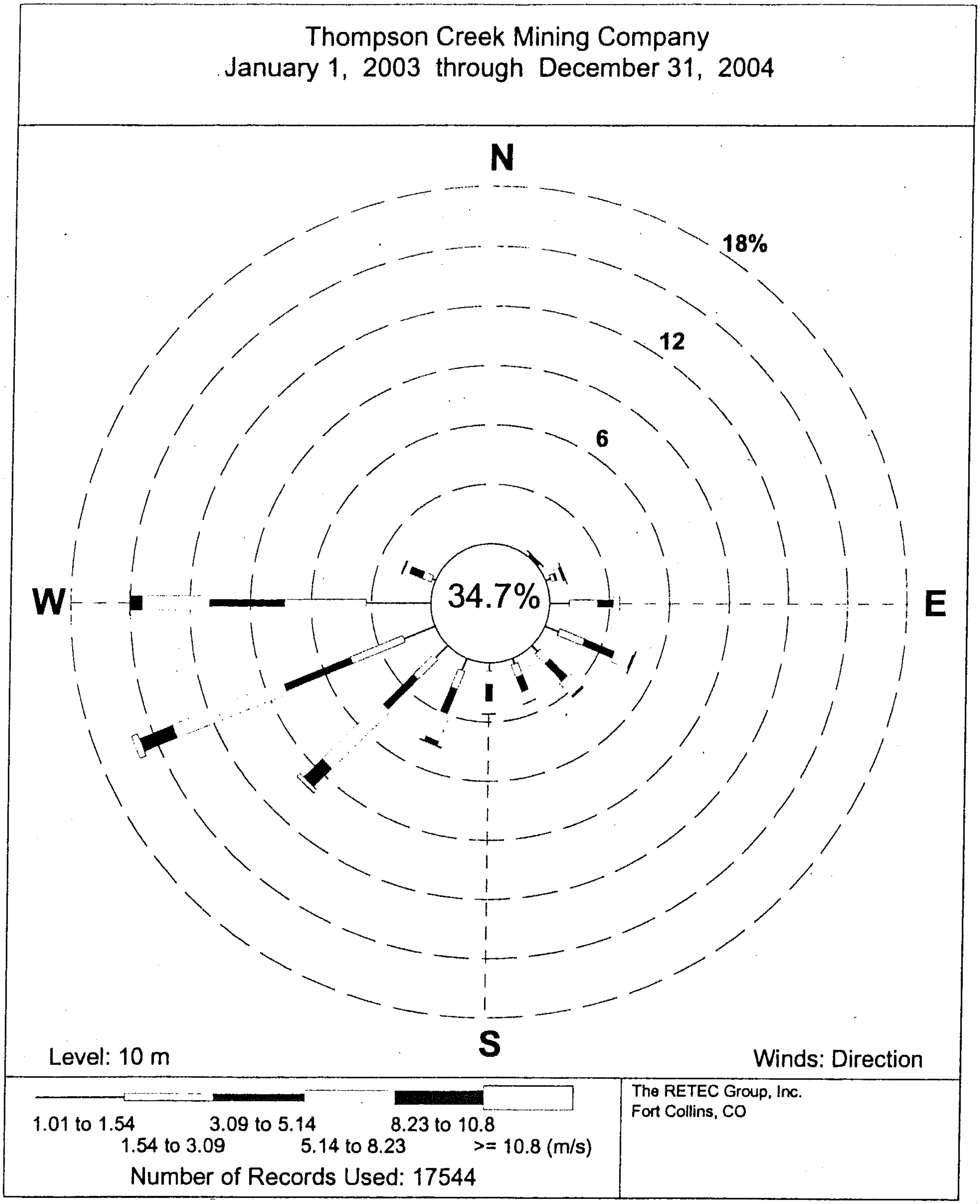


Figure 8 Thompson Creek Wind Rose

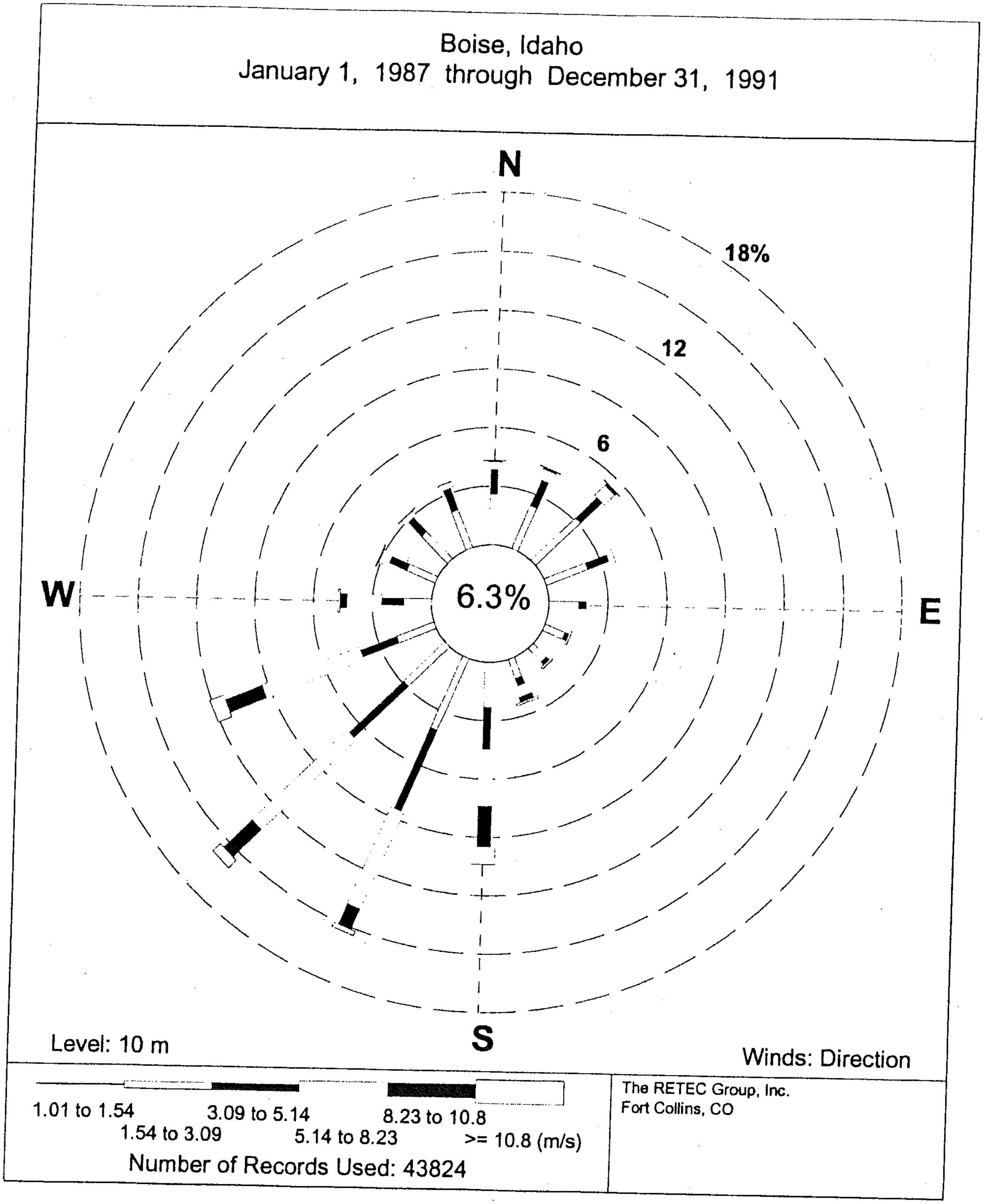
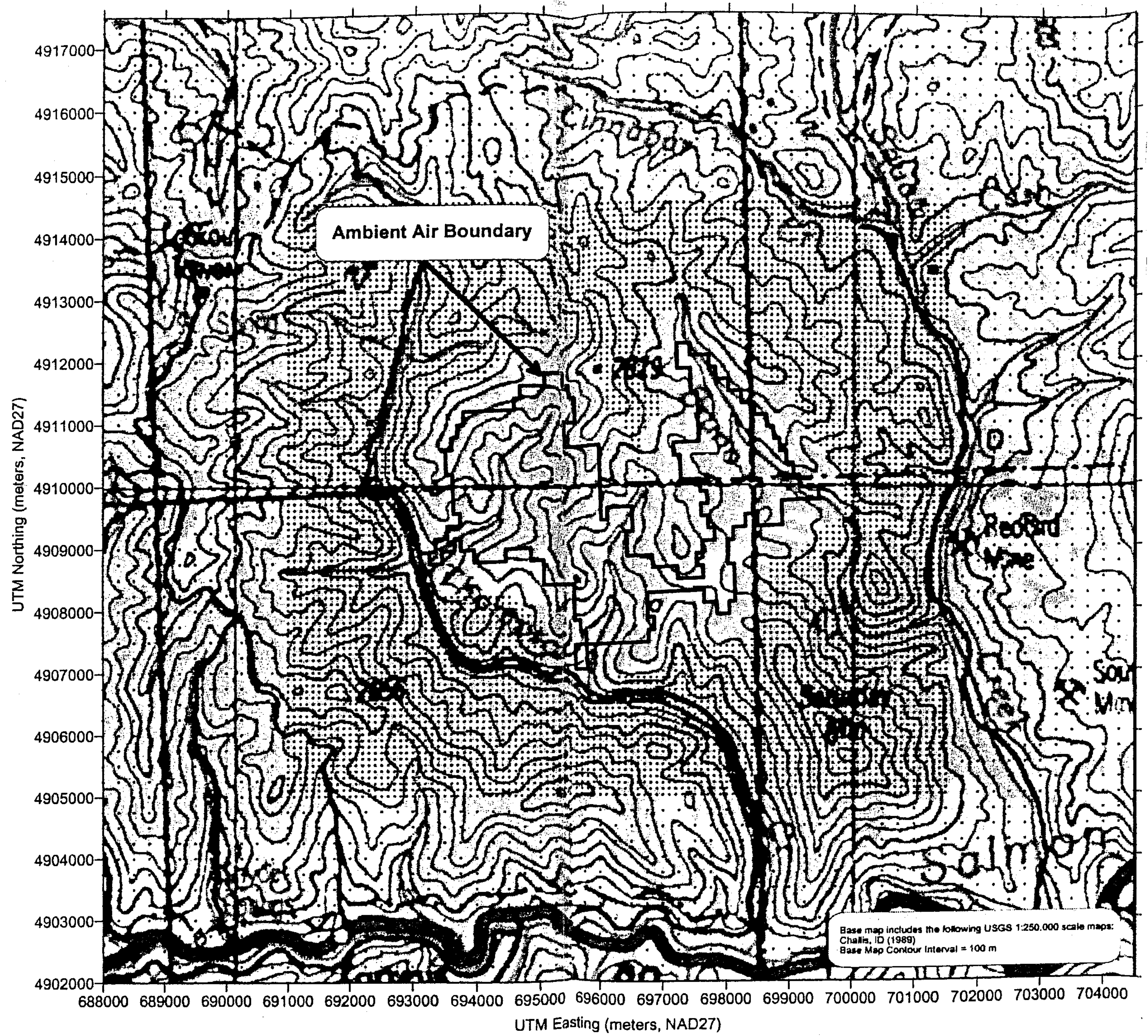


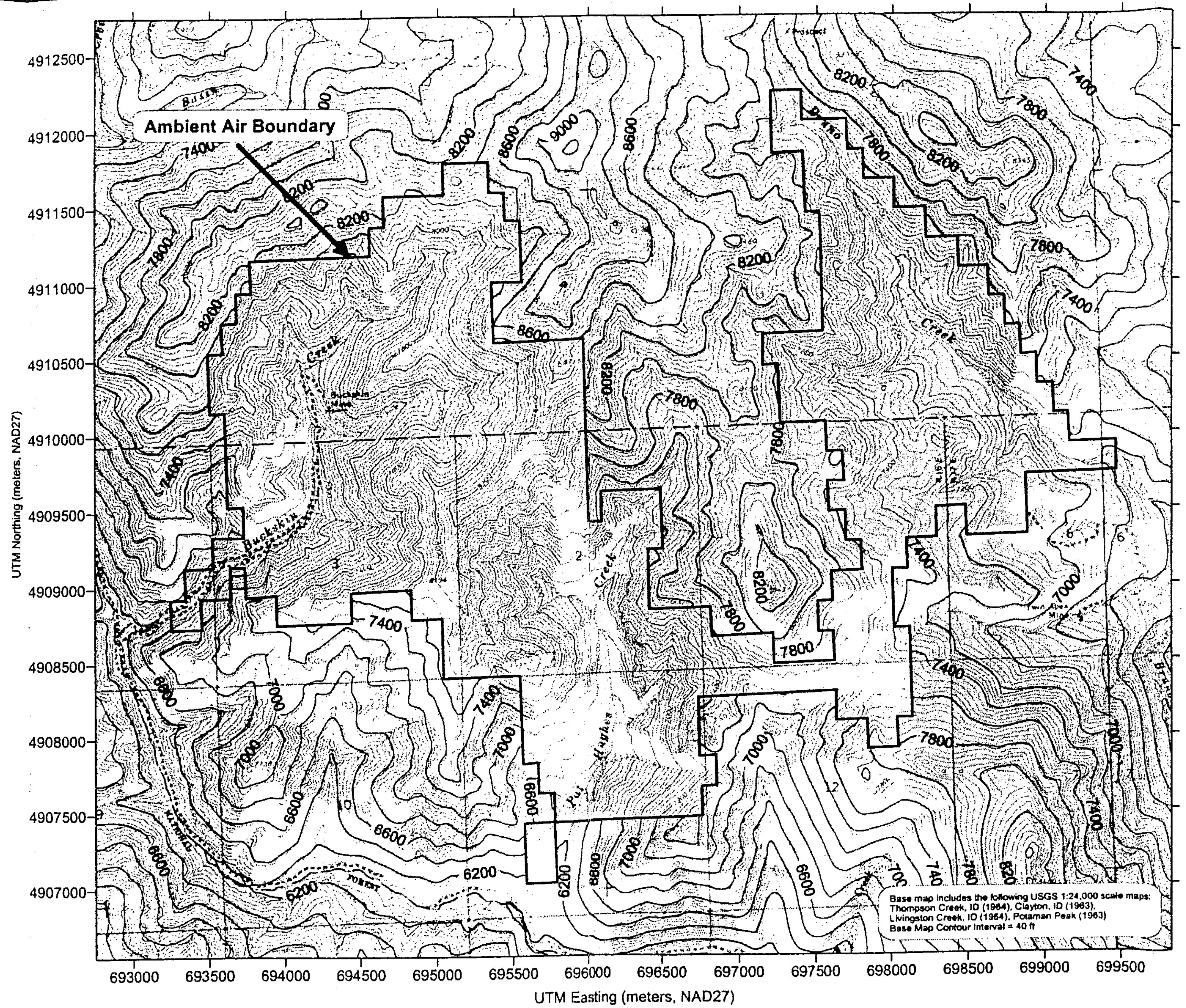
Figure 9 Boise Wind Rose



RETEC

THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	FAR-FIELD RECEPTOR GRID
Date: 03/27/2006	

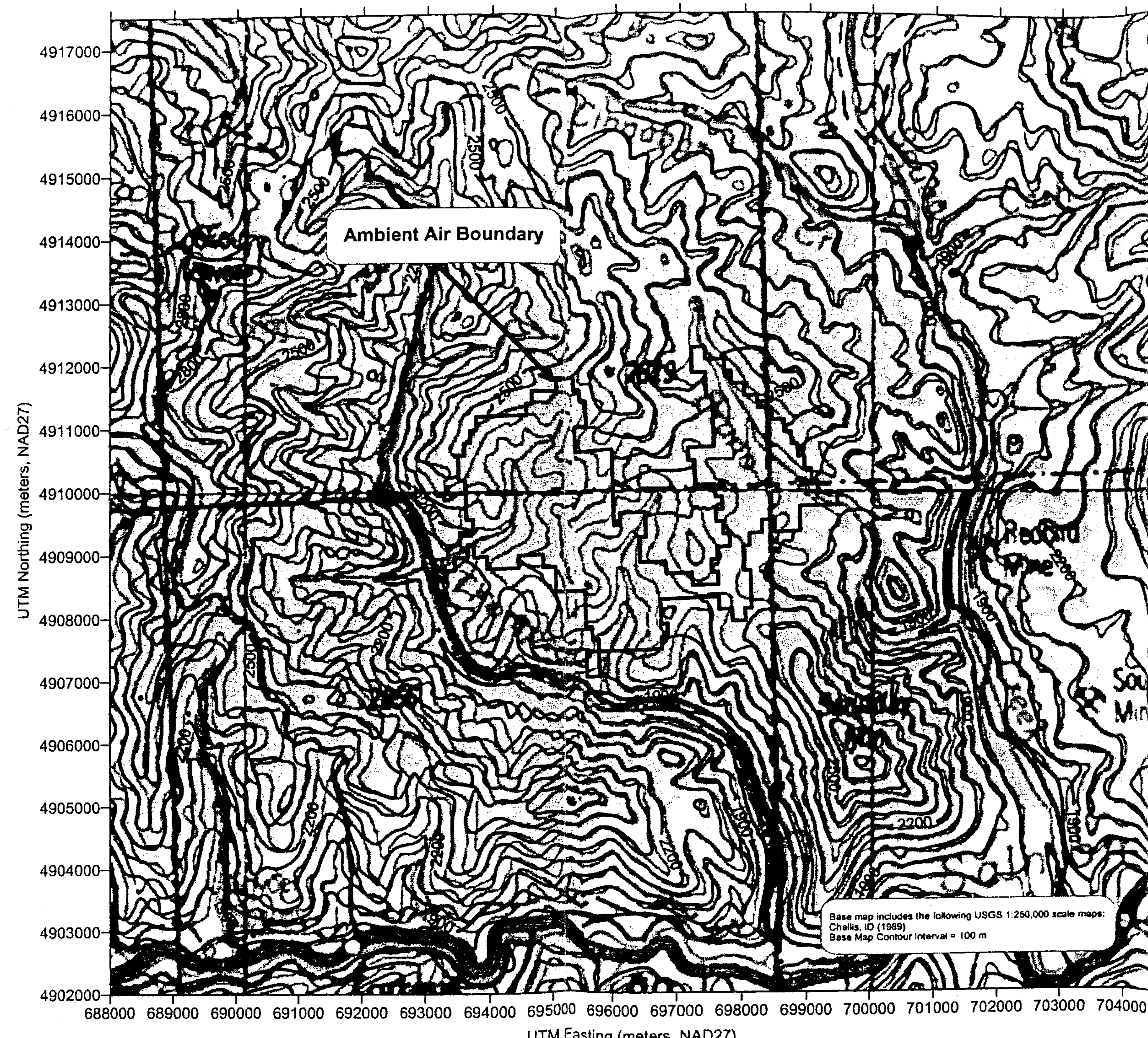
Figure 11 Far-Field Receptor Grid



THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	CONTOURED NEAR-FIELD RECEPTOR GRID
Date: 03/27/2006	

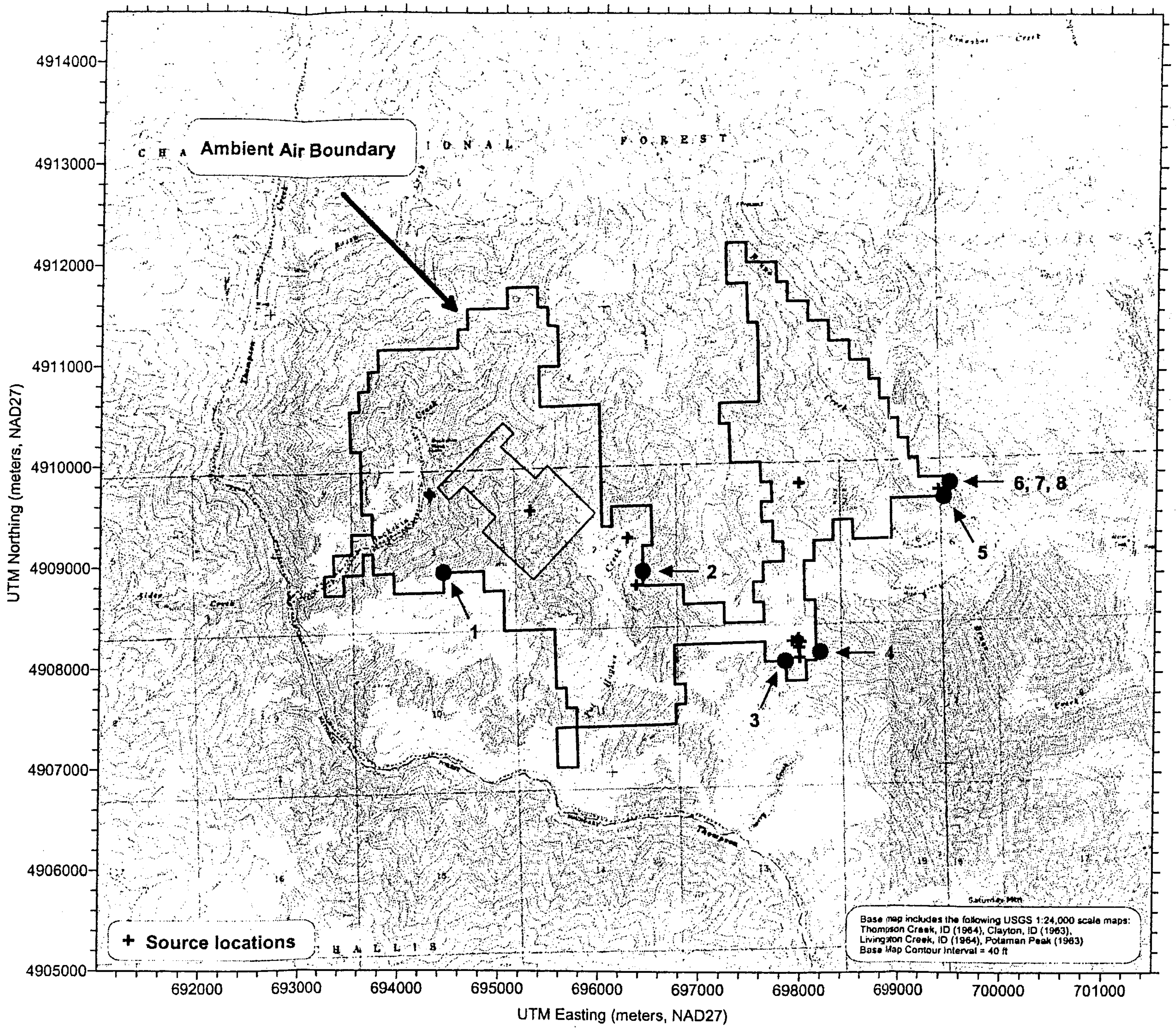
RETEC

Figure 12 Contoured Near-Field Receptor Grid



THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	CONTOURED FAR-FIELD RECEPTOR GRID
Date: 03/27/2006	

Figure 13 Contoured Far-Field Receptor Grid



Maximum Predicted Impact Locations

1. PM_{10} Maximium 24 hour impact (96.7 $\mu g/m^3$)
2. PM_{10} Maximum annual impact (3.8 $\mu g/m^3$)
3. SO_2 Maximum annual impact (2.5 $\mu g/m^3$)
4. SO_2 Maximum 3 hour impact (102.5 $\mu g/m^3$)
5. CO Maximum 1 hour impact (393.3 $\mu g/m^3$)
6. NO_2 Maximum annual impact (4.7 $\mu g/m^3$)
7. CO Maximun 8 hour impact (194.2 $\mu g/m^3$)
8. SO_2 Maximum 24 hour impact (32.4 $\mu g/m^3$)

RETEC

THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	MAXIMUM PREDICTED IMPACTS FOR ALL POLLUTANTS TCMC EUs ONLY
Date: 03/27/2006	

Figure 14 Maximum Model-Predicted Impacts – TCMC EUs Only

Appendix A
Modeling Protocol Approval

<Kevin.Schilling@deq.idaho.gov>
03/23/2006 12:52 PM

To <pmiller@retec.com>
cc
bcc
Subject Thompson Creek Mine Modeling Protocol

Mr. Miller,

DEQ has reviewed the proposed air quality modeling protocol, received by DEQ on 3/13/06, for the Thompson Creek Mining Company (TCMC) Tier II Operating Permit renewal. DEQ determined that the methods and data proposed for the air quality analyses are appropriate and acceptable, with the following considerations addressed in the submitted analyses:

1) The protocol states that fugitive emissions from various sources (haul roads, drilling, blasting, grading/bulldozing, combustion from mobile equipment, and wind erosion from storage piles) will not be included in the modeling analyses, as discussed with DEQ. The decision on not including these sources in the modeling analyses was based on a reasonably high level of emissions control through implemented measures and the high degree of variability and uncertainty of emissions estimations. In cases where fugitive emissions are not modeled, the issued Tier II Operating Permit will likely require measures to control fugitive dust emissions or a fugitive dust control plan.

2) ISC-PRIME was proposed for cases where a receptor may be located within a building recirculation cavity. It was then stated that the total air quality impact would be calculated as the sum of the ISC3ST and ISC-PRIME impacts. If receptors are located within recirculation cavities DEQ will allow and prefers that ISC-PRIME to be used for the entire modeling analyses. In most all situations, the PRIME algorithm is recognized as being superior to the downwash algorithm in ISC3ST.

3) Both the surface and upper air meteorological data provided by DEQ was collected from Boise. If the windrose from the Boise data do not seem reasonable for the topography in the region of the mine, the wind vectors can be rotated to provide a more realistic wind direction.

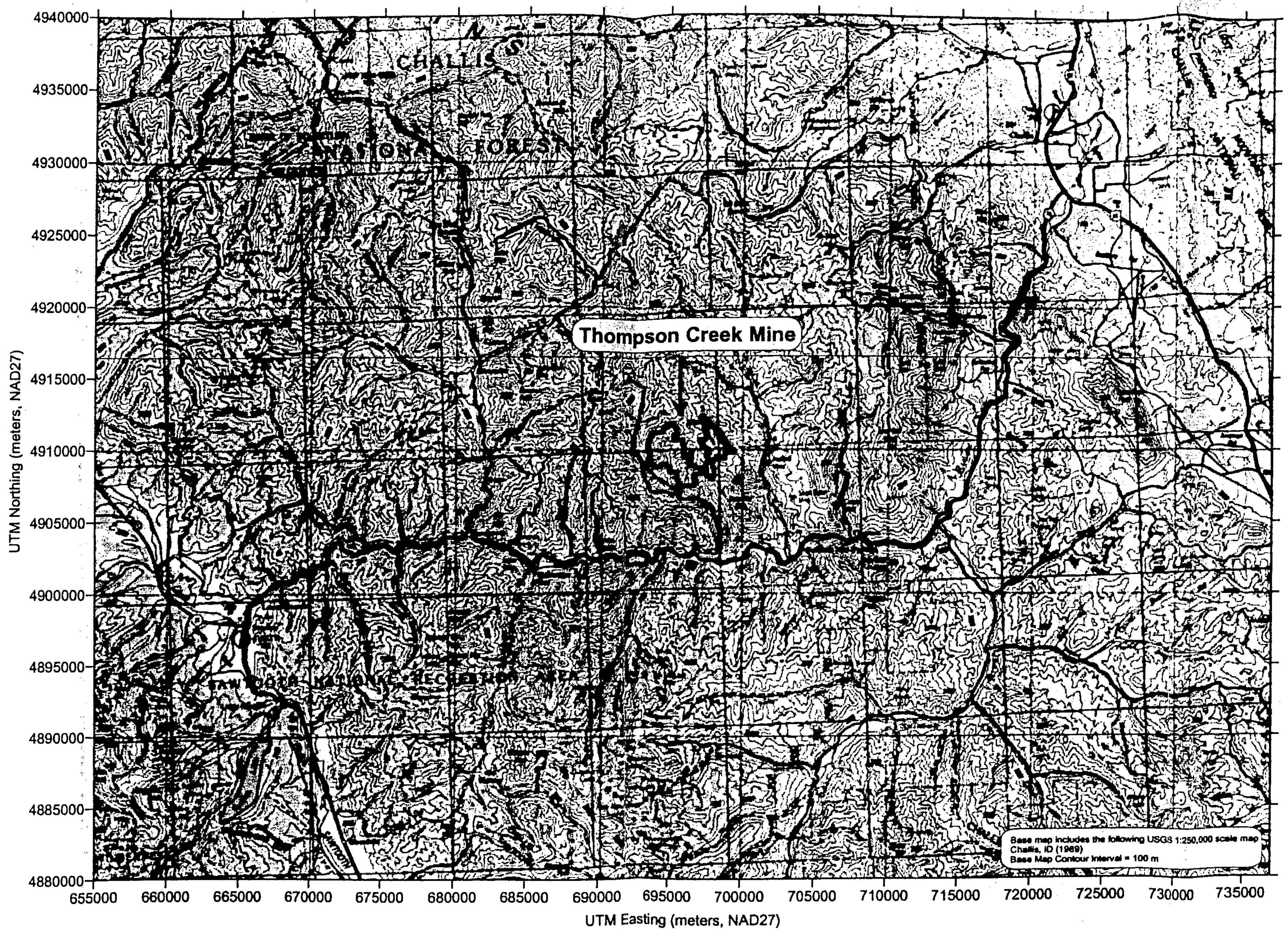
4) The protocol states that elevations for structures and EUs will be determined from recent topographic maps rather than from DEM data. When doing this, you should make sure there are not substantial differences between the datum used. In some instances where receptor elevations were calculated differently from buildings and EUs, buildings or EUs were either located below grade or were left suspended above ground.

This email provides documentation of a DEQ-approved modeling protocol.

Please call me at 208 373-0112 if you have any questions regarding the air quality analyses.

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Appendix D Ambient Air Quality Impact Analysis



RETEC

THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	REGIONAL MAP
Date: 03/27/2006	

Figure 1 Regional Map

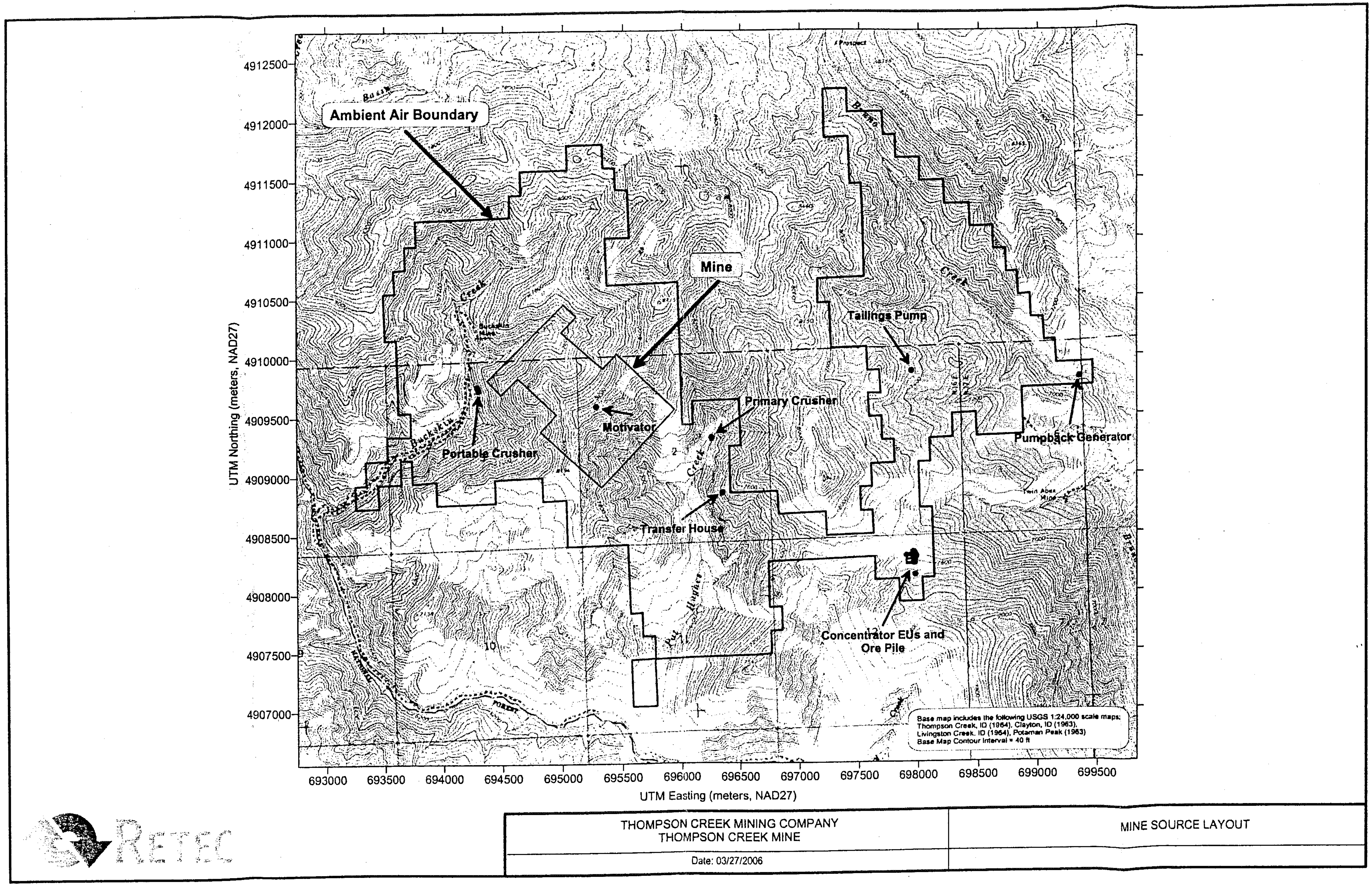


Figure 2 Mine Source Layout

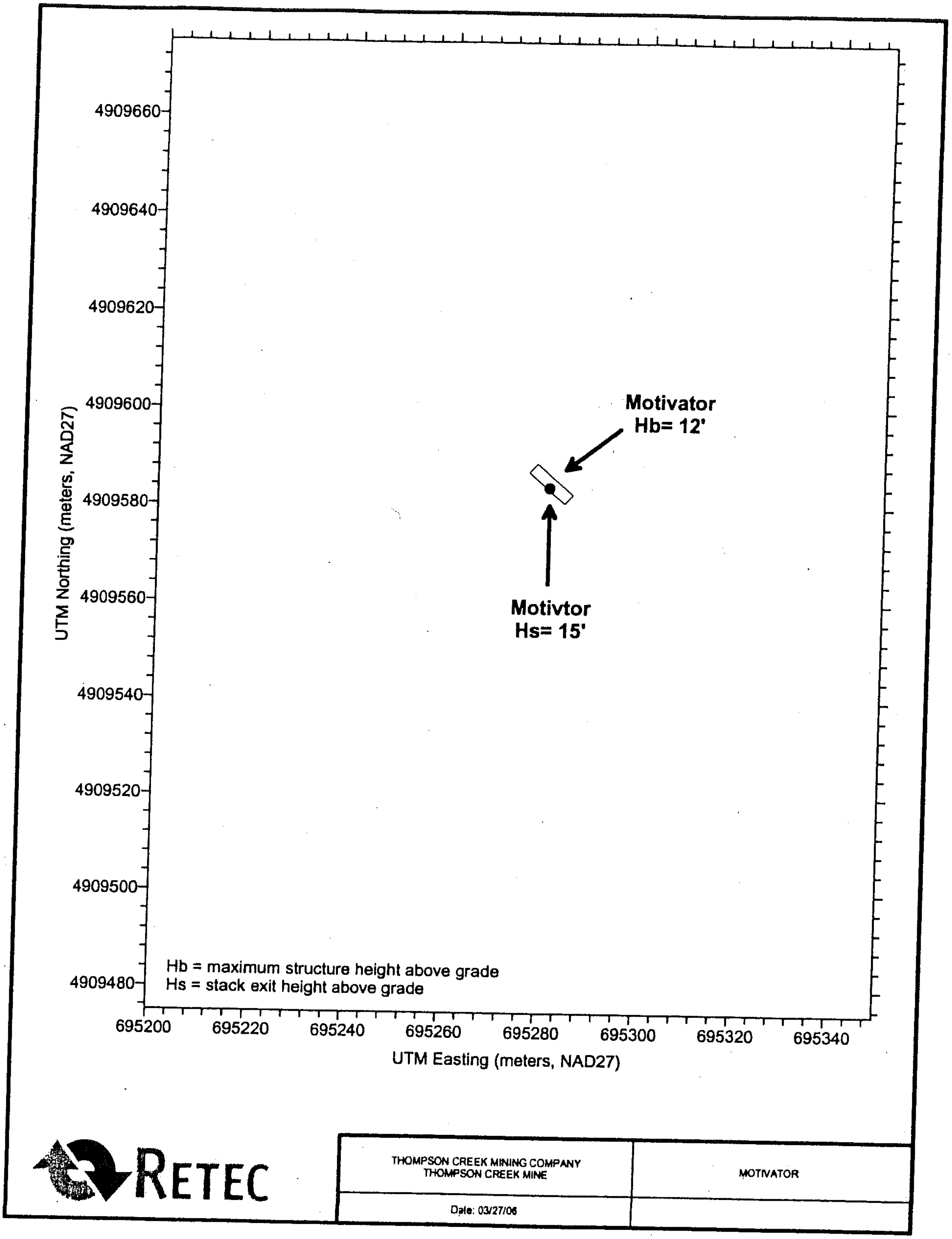


Figure 3 Motivator

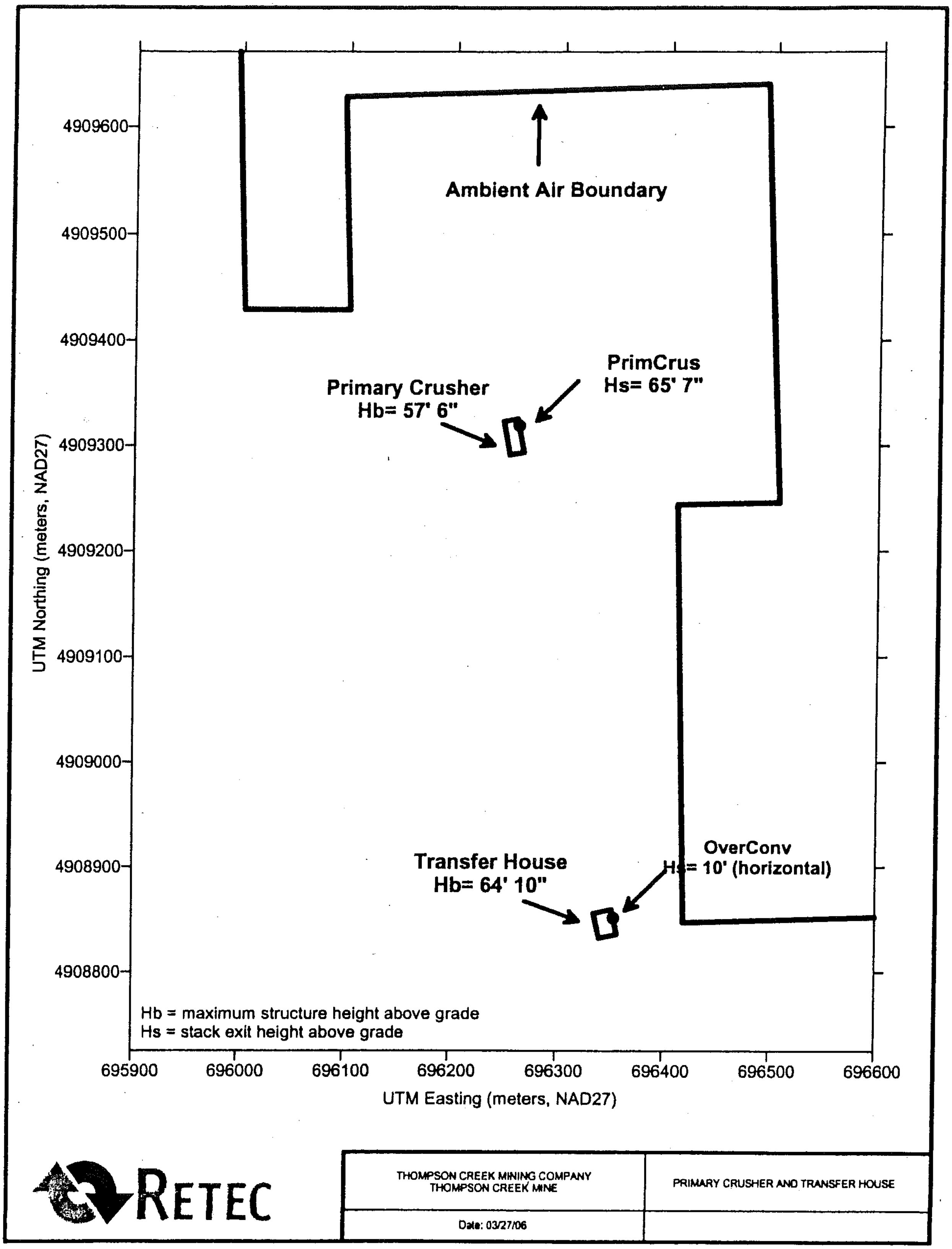
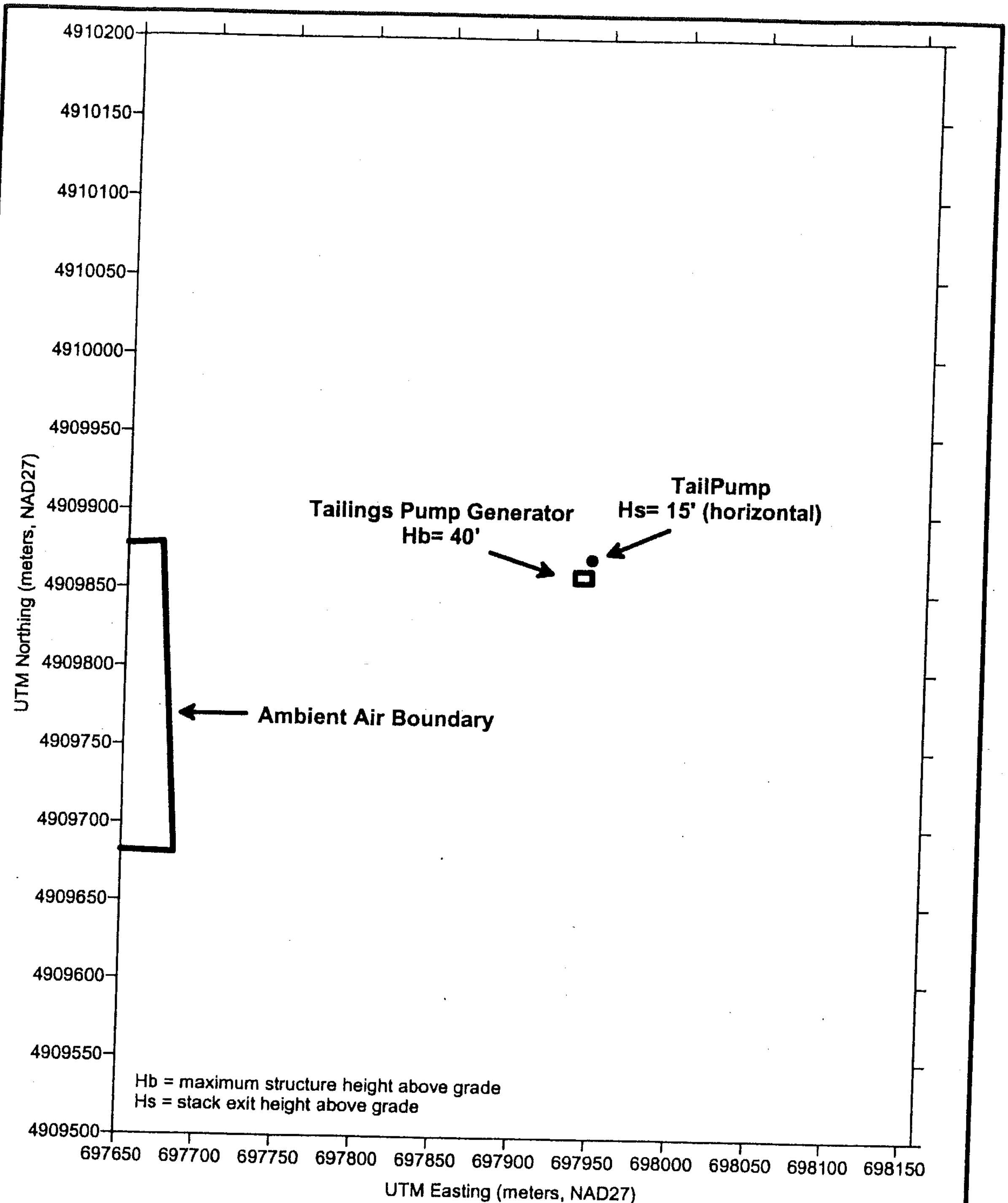


Figure 4 Primary Crusher and Transfer House



RETEC

THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	TAILINGS PUMP GENERATOR
Date: 03/27/06	

Figure 5 Tailings Pump Generator

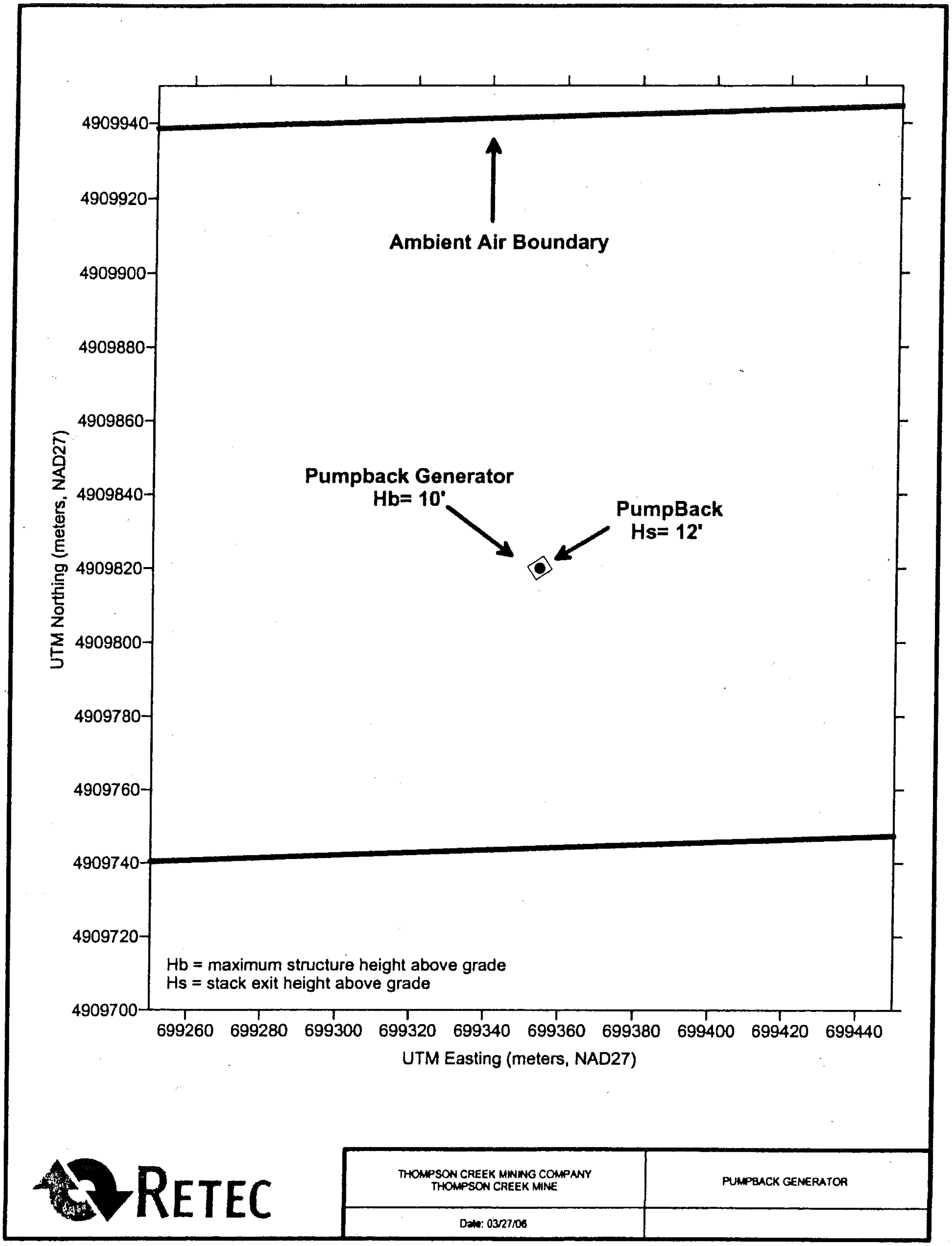
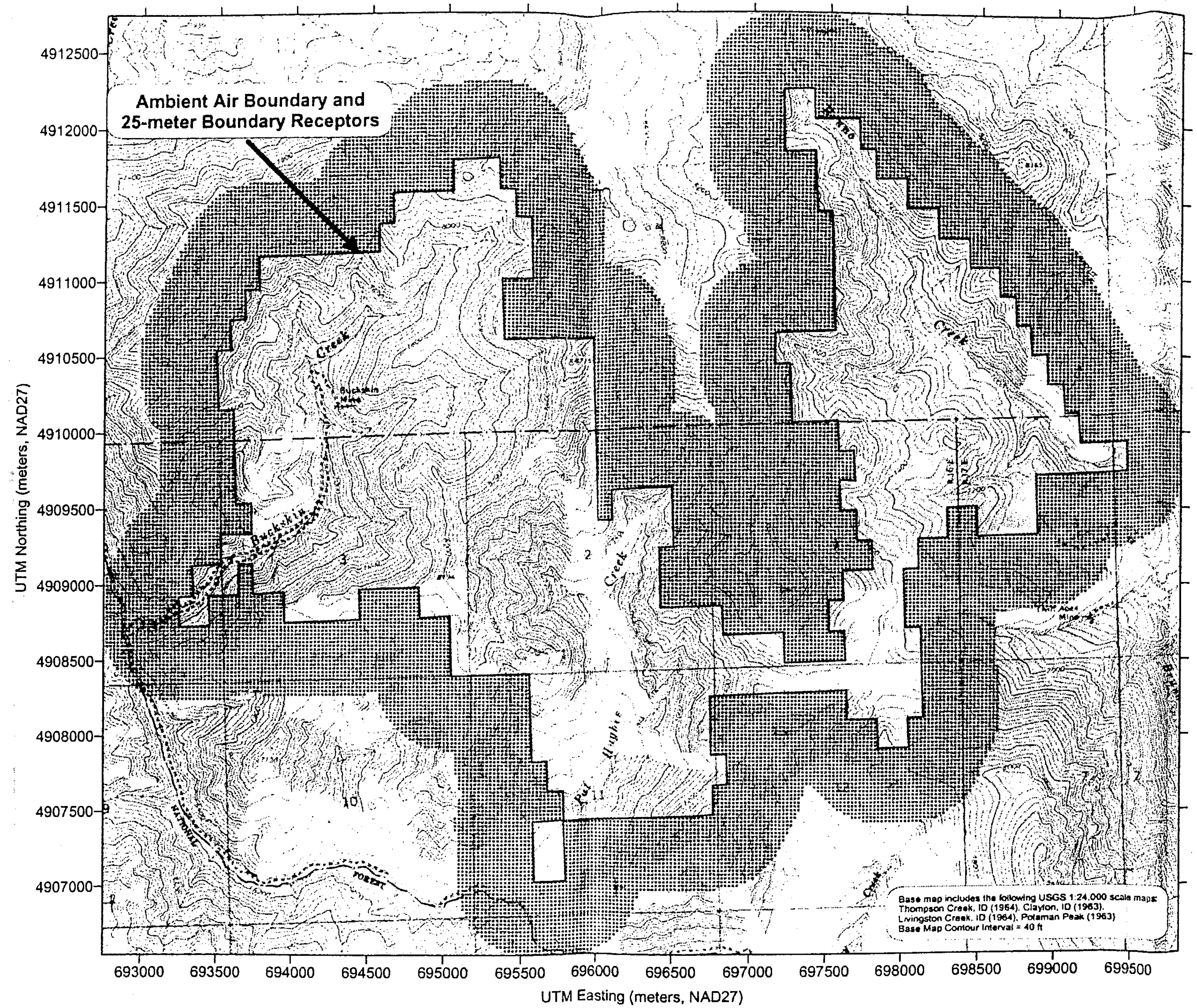


Figure 6 Pumpback Generator



THOMPSON CREEK MINING COMPANY THOMPSON CREEK MINE	NEAR-FIELD RECEPTOR GRID
Date: 03/27/2006	

Figure 10 Near-Field Receptor Grid

Table 2 Physical and Modeled Release Parameters – Point Sources

Source Description	Model ID	Physical Stack Exit Parameters								Modeled Stack Exit Parameters			
		Height		Temperature		Velocity		Diameter		Height	Temperature	Velocity	Diameter
		(ft)	(m)	(F)	(K)	(ft/s)	(m/s)	(in)	(m)	(m)	(K)	(m/s)	(m)
Primary Crusher	PrimCrus	65.6	19.99	ambient	ambient	70.16	21.384	28.00	0.711	19.99	0	21.384	0.711
Overland Conveyor	OverConv	10.0	3.05	ambient	ambient	47.16	14.373	18.00	0.457	3.05	0	0.001	0.001
East Ore Feeder	EastOre	85.3	26.01	55	286	58.39	17.798	18.50	0.470	26.01	286	17.798	0.470
West Ore Feeder	WestOre	85.3	26.01	55	286	58.39	17.798	18.50	0.470	26.01	286	17.798	0.470
Holoflite Dryer #1	HoloDryr	81.0	24.69	80	300	14.39	4.385	11.75	0.298	24.69	300	4.385	0.298
Leach Plant	Leach	90.3	27.51	60	289	64.46	19.647	16.00	0.406	27.51	289	19.647	0.406
Holoflite Dryer #2, Rotary Kiln, Lube Grade Dryer Stack	LubeDryr	90.3	27.51	70	294	23.87	7.277	8.00	0.203	27.51	294	7.277	0.203
Jet Mill Baghouse Stack	JetMill	37.5	11.43	78	299	31.45	9.587	14.95	0.380	11.43	299	0.001	0.380
Pancake Mill Feed Bin Baghou	PanMill	14.8	4.50	78	299	67.34	20.527	8.25	0.210	4.50	299	0.001	0.001
Pebble Lime Baghouse	PebbleLm	68.9	20.99	ambient	ambient	42.44	12.936	12.00	0.305	20.99	0	12.936	0.305
Boiler #1	Boiler#1	84.0	25.60	500	533	8.66	2.639	12.00	0.305	25.60	533	0.001	0.305
Hot Oil Boiler	HotOil	84.0	25.60	500	533	19.87	6.057	12.00	0.305	25.60	533	0.001	0.305
Motivator	Motivatr	15.0	4.57	900	755	444.13	135.371	4.00	0.102	4.57	755	135.371	0.102
Mill Auxiliary Generator	MillAux	20.0	6.10	1200	922	133.27	40.619	6.00	0.152	6.10	922	0.001	0.152
Pumpback Generator	PumpBack	12.0	3.66	900	755	206.26	62.870	6.00	0.152	3.66	755	62.870	0.152
Tailings Pump Generator	TailPump	15.0	4.57	900	755	60.66	18.490	10.00	0.254	4.57	755	0.001	0.001
Tech Fine Packaging	PackBin	38.0	11.58	80	300	12.73	3.881	6.00	0.152	11.58	300	0.001	0.001
Super Fine Packaging Bin Baghouse	SFStor	25.0	7.62	73	296	50.39	15.360	6.00	0.152	7.62	296	0.001	0.001

[illegible]

Donot use PM in calculation of fees.

~~Donot use Portable crusher~~

Table 1 Facility Emission Unit Inventory

PM_{10} = 59.87 t/yr

NO_x = 88.76

SO_2 = 20.06

CO = 19.6

Source Description	Pollutant	hr/yr	Short-Term Emission Rates		Annual Emission Rates		Stack Exhaust Parameters						
							Height (ft)	Diameter (ft)	Flow (acfm)	Velocity (ft/sec)	Temp. (F °)	Orientation Vert/Horiz	Covered (Y/N)
Portable Crusher	PM_{10}	3,500 hr/yr	14.96 lb/hr	1.8852 g/s	26.18 ton/yr	0.7532 g/s	Volume Source				ambient	NA	NA
Truck Dump to Primary Crusher	PM_{10}	3,500 hr/yr	0.71 lb/hr	0.0892 g/s	1.24 ton/yr	0.0356 g/s	Volume Source				ambient	NA	NA
Primary Crusher	PM_{10}	3,650 hr/yr	2.23 lb/hr	0.2803 g/s	4.06 ton/yr	0.1168 g/s	65.58	2.33	18,000.0	70.16	ambient	Vertical	No
Overland Conveyor	PM_{10}	3,650 hr/yr	2.67 lb/hr	0.3364 g/s	4.87 ton/yr	0.1402 g/s	10.00	1.50	5,000.0	47.16	ambient	Horizontal	No
Ore drop to Mill Stockpile	PM_{10}	3,650 hr/yr	6.79 lb/hr	0.8552 g/s	12.39 ton/yr	0.3563 g/s	Volume Source				ambient	NA	NA
East Ore Feeder	PM_{10}	8,760 hr/yr	0.50 lb/hr	0.0630 g/s	2.19 ton/yr	0.0630 g/s	85.33	1.54	6,540	58.39	55.0	Vertical	No
West Ore Feeder	PM_{10}	8,760 hr/yr	0.50 lb/hr	0.0630 g/s	2.19 ton/yr	0.0630 g/s	85.33	1.54	6,540	58.39	55.0	Vertical	No
Holoflite Dryer #1	PM_{10}	8,760 hr/yr	0.02 lb/hr	0.0023 g/s	0.08 ton/yr	0.0023 g/s	81.00	0.98	650	14.39	80.0	Vertical	No
Leach Plant	HCl	8,760 hr/yr	0.003 lb/hr	0.0004 g/s	0.01 ton/yr	0.0004 g/s	90.25	1.33	5,400	64.46	60.0	Vertical	No
Holoflite Dryer #2	Common vent to Lube Grade Dryer Stack						90.25	0.67	500	23.87	70.0	Vertical	No
Rotary Kiln													
Lube Grade Dryer Stack	PM_{10}	7,200 hr/yr	0.001 lb/hr	0.0001 g/s	0.004 ton/yr	0.0001 g/s							
Jet Mill Baghouse Stack[1]	PM_{10}	7,200 hr/yr	0.016 lb/hr	0.0020 g/s	0.058 ton/yr	0.0017 g/s	37.50	1.25	2,300	31.45	78.0	Vertical	Yes
Tech Fine Packaging Baghouse	PM_{10}	7,200 hr/yr	0.013 lb/hr	0.0016 g/s	0.047 ton/yr	0.0013 g/s	38.00	0.50	150	12.73	80.0	Horizontal	No
Pancake Mill Feed Bin Baghouse	PM_{10}	3,412 hr/yr	0.001 lb/hr	0.0001 g/s	0.002 ton/yr	0.0000 g/s	14.75	0.69	1,500	67.34	78.0	Horizontal	No
Super Fine Packaging Bin Baghouse	PM_{10}	8,760 hr/yr	0.024 lb/hr	0.0030 g/s	0.105 ton/yr	0.0030 g/s	25.00	0.50	594	50.39	73.0	Horizontal	No
Pebble Lime Baghouse	PM_{10}	417 hr/yr	0.106 lb/hr	0.0133 g/s	0.022 ton/yr	0.0006 g/s	68.88	1.00	2,000	42.44	ambient	Vertical	No
Boiler #1	PM_{10}	8,760 hr/yr	0.0001 lb/hr	0.0000 g/s	0.29 ton/yr	0.0083 g/s	84.00	1.00	408	8.66	500.0	Vertical	Yes
	NO_x		0.66 lb/hr	0.0832 g/s	2.89 ton/yr	0.0832 g/s							
	SO_2		2.34 lb/hr	0.2952 g/s	10.26 ton/yr	0.2952 g/s							
	CO		0.17 lb/hr	0.0208 g/s	0.72 ton/yr	0.0208 g/s							
Hot Oil Boiler	PM_{10}	8,760 hr/yr	0.00 lb/hr	0.0000 g/s	0.12 ton/yr	0.0034 g/s	84.00	1.00	936	19.87	500.0	Vertical	Yes
	NO_x		0.27 lb/hr	0.0340 g/s	1.18 ton/yr	0.0340 g/s							
	SO_2		0.96 lb/hr	0.1208 g/s	4.20 ton/yr	0.1208 g/s							
	CO		0.07 lb/hr	0.0085 g/s	0.30 ton/yr	0.0085 g/s							
Motivator	PM_{10}	3,000 hr/yr	3.28 lb/hr	0.4130 g/s	4.92 ton/yr	0.1414 g/s	15.00	0.33	2,325	444.13	900.0	Vertical	No
	NO_x		46.19 lb/hr	5.8198 g/s	69.29 ton/yr	1.9931 g/s							
	SO_2		3.05 lb/hr	0.3849 g/s	4.58 ton/yr	0.1318 g/s							
	CO		10.13 lb/hr	1.2766 g/s	15.20 ton/yr	0.4372 g/s							
Mill Auxiliary Generator	PM_{10}	500 hr/yr	0.58 lb/hr	0.0735 g/s	0.15 ton/yr	0.0042 g/s	20.00	0.50	1,570	133.27	1,200.0	Vertical	Yes
	NO_x		8.22 lb/hr	1.0351 g/s	2.05 ton/yr	0.0591 g/s							
	SO_2		0.54 lb/hr	0.0684 g/s	0.14 ton/yr	0.0039 g/s							
	CO		1.80 lb/hr	0.2270 g/s	0.45 ton/yr	0.0130 g/s							
Pumpback Generator	PM_{10}	500 hr/yr	0.99 lb/hr	0.1247 g/s	0.25 ton/yr	0.0071 g/s	12.00	0.50	2,430	206.26	900.0	Vertical	No
	NO_x		13.95 lb/hr	1.7577 g/s	3.49 ton/yr	0.1003 g/s							
	SO_2		0.92 lb/hr	0.1162 g/s	0.23 ton/yr	0.0066 g/s							
	CO		3.06 lb/hr	0.3856 g/s	0.77 ton/yr	0.0220 g/s							
Tailings Pump Generator	PM_{10}	500 hr/yr	2.80 lb/hr	0.3526 g/s	0.70 ton/yr	0.0201 g/s	15.00	0.83	1,985	60.66	900.0	Horizontal	No
	NO_x		39.43 lb/hr	4.9683 g/s	9.86 ton/yr	0.2836 g/s							
	SO_2		2.61 lb/hr	0.3286 g/s	0.65 ton/yr	0.0188 g/s							
	CO		8.65 lb/hr	1.0898 g/s	2.16 ton/yr	0.0622 g/s							

[1] stack dimensions are 9" x 19.5". Diameter (feet) = [(sqrt ((4) * (9) * (19.5) / PI)] / (12)

Table 3 Physical and Modeled Release Parameters – Volume Sources

Source Description	Model ID	Physical Parameters				Modeled Parameters		
		Length		Height		Release Hgt	Sigma-y Init	Sigma-z Init
		(ft)	(m)	(ft)	(m)	(m)	(m)	(m)
Portable Crusher	PIC_area	164.0	50.00	0.00	0.0	0.00	11.63	2.13
Truck Dump to Primary Crusher	PIC_load	9.8	3.00	0.00	0.0	0.00	0.70	1.13
Ore drop to Mill Stockpile	Ore_Drop	5.0	1.52	221.50	67.5	67.51	0.35	2.48

Table 4 Background Pollutant Concentrations

Pollutant	Averaging Period	Background Concentration [1] ($\mu g/m^3$)
NO_2	Annual	4.3
SO_2	3-hour	34
	24-hour	26
	Annual	8
PM_{10}	24-hour	43
	Annual	9.6
CO	1-hour	3,600
	8-hour	2,300

[1] Provided by IDEQ.